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REPLY UNDER 37 C.F.R. § 1.116
EXPEDITED PROCEDURE
EXAMINING GROUP 2814

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PATENT & TRADEMARK OFFICE

PATENT
2342-107P

IN THE U.S. PATENT AND TRADEMARK OFFICE

Applicant: Mitsuhiro HIRANO

Appl. No.: 08/813,200 Group: 2814

Filed: March 7, 1997 Examiner: M. DIETRICH

For: SUBSTRATE PROCESSING APPARATUS WITH LOCAL EXHAUST FOR REMOVING CONTAMINANTS (AS AMENDED)

LARGE ENTITY TRANSMITTAL FORM
FOR REPLY AFTER FINAL UNDER 37 C.F.R. § 1.116

BOX AF
Assistant Commissioner for Patents
Washington, DC 20231

January 20, 2000

Sir:

Transmitted herewith is an amendment in the above-identified application.

☐ The enclosed document is being transmitted via the Certificate of Mailing provisions of 37 C.F.R. § 1.8.

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The fee has been calculated as shown below:

	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR		PRESENT EXTRA	RATE	ADDITIONAL FEE
TOTAL	23	-	26	=	0	$ 18	$0.00
INDEPENDENT	4	-	4	=	0	$ 78	$0.00
_____ FIRST PRESENTATION OF A MULTIPLE CLAIM						$260	$0.00
						TOTAL	$0.00

☐ Petition for _____( ) month(s) extension of time pursuant to 37 C.F.R. §§ 1.17 and 1.136(a). $0.00 for the extension of time.

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☐ Please charge Deposit Account No. 02-2448 in the amount of $0.00. This form is submitted in triplicate.

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Respectfully submitted,

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2342-107P

(Rev. 01/08/2000)

Box: AF
REPLY UNDER 37 C.F.R. § 1.116
EXPEDITED PROCEDURE
EXAMINING GROUP 2814
PATENT
2342-107P

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Mitsuhiro HIRANO	
Application No.	08/813,200	Group: 2814
Filed:	March 7, 1997	Examiner: M. Dietrich
For:	SUBSTRATE PROCESSING APPARATUS WITH LOCAL EXHAUST FOR REMOVING CONTAMINANTS (As Amended)	

Response After Final Under 37 C.F.R. 1.116

Assistant Commissioner for Patents
Washington, D.C. 20231

January 20, 2000

In reply to the outstanding Office Action dated October 20, 1999, the following amendments and remarks are respectfully submitted.

In the Claims

Please Amend claims 1, 5, 7, 12, 15-17, and 27-29 as follows.

1. (Three times amended) A substrate processing apparatus, comprising:

a substrate processing chamber for processing a substrate;

a load lock chamber;

a gas supply for supplying gas into said load lock chamber;

a chamber exhaust for exhausting said load lock chamber;

a valve disposed in said chamber exhaust;

a moving mechanism provided in said load lock chamber for moving said substrate;

a local exhaust for locally exhausting a dust generating portion of said moving mechanism;

a flow rate regulator in one of said gas supply, said chamber exhaust and said local exhaust; and

a controller, wherein

during movement of said substrate by said moving mechanism, said gas supply supplies gas to said load lock chamber, said valve is opened, [and exhausting of] said local exhaust exhausts the dust generating portion of said moving mechanism [by said local exhaust], and said controller controls said flow rate regulator.

5. (Three times amended) A substrate processing apparatus as recited in claim 4, wherein said chamber exhaust includes an atmospheric vent line, pressure at one end of said atmospheric pressure vent line is substantially equal to the atmospheric pressure, and the other end of said atmospheric pressure vent line is [communicated] connected with [the inside of] said load lock chamber, and

said flow rate regulator is disposed in said atmospheric pressure vent line.

7. (Twice amended) A substrate processing apparatus as recited in claim 1, wherein said chamber exhaust includes an atmospheric pressure vent line and a vacuum exhaust line which is to be connected to a vacuum pump,

pressure at one end of said atmospheric pressure vent line is substantially equal to the atmospheric pressure and the other end is [communicated] connected with said load lock chamber, and

said local exhaust is connected to said vacuum exhaust line.

12. (Three times amended) A substrate processing apparatus, comprising:

a substrate processing chamber for processing a substrate;

a load lock chamber;

a gas supply for supplying gas into said load lock chamber;

a chamber exhaust for exhausting said load lock chamber;

a moving mechanism provided within said load lock chamber and capable of moving said substrate;

a local exhaust for locally exhausting a dust generating portion of said moving mechanism;

a flow rate detector for measuring an exhaust amount of said local exhaust;

a controller, wherein

during movement of said substrate by said moving mechanism, said controller [which] compares the exhaust amount of said local exhaust with a predetermined exhaust amount to monitor the state of said local exhaust.

15. (Twice amended) A substrate processing apparatus, comprising:

a substrate processing chamber for processing a substrate;

a load lock chamber;

a gas supply for supplying gas into said load lock chamber;

a chamber exhaust for [exhasting] exhausting said load lock chamber;

a moving mechanism provided within said load lock chamber and capable of moving said substrate;

a first vacuum exhaust line connected to a vacuum pump;

a second vacuum exhaust line which is [communicated] connected with said substrate processing chamber and said first vacuum exhaust line;

a local exhaust which is capable of locally exhausting a dust generating portion of said moving mechanism, and is [communicated] connected with said first vacuum exhaust line;

a valve connected to an intermediate portion of said local exhaust; and

a valve controller capable of controlling said valve;

wherein during processing of said substrate in said substrate processing chamber, said valve controller controls said valve to be closed.

16. (Twice amended) A substrate processing apparatus as recited in claim 15, further comprising a third vacuum exhaust line which is [communicated] connected with said load lock chamber and said first exhaust line, and a second valve provided at an intermediate portion of said third vacuum exhaust line, wherein

said valve controller is also capable of controlling said second valve, and

during processing of said substrate in said substrate processing chamber, said valve controller controls said second valve to be closed.

17. (Three times amended) A substrate processing apparatus as recited in claim 1, wherein said gas supply [means] is connected [communicated] with said load lock chamber at a first region of said load lock chamber in which said substrate moves, and said chamber exhaust is connected [communicated] with said load lock chamber at a second region of said load lock chamber in which said moving mechanism is provided.

27. (Amended) A substrate processing apparatus as recited in claim 1, further comprising a cover for covering said dust generating portion of said moving mechanism, wherein

said cover has an opening through which a space covered with said cover is connected [communicates] with the inside of said load lock chamber, and

said local exhaust is connected [communicates] with said space covered with said cover and said gas supply and said chamber exhaust are not connected [do not communicate] with said space covered with said cover.

28. (Amended) A substrate processing apparatus, comprising:

a substrate processing chamber for processing a substrate;

a load lock chamber;

a gas supply for supplying gas into said load lock chamber;

a chamber exhaust for exhausting said load lock chamber;

a moving mechanism provided in said load lock chamber and capable of moving said substrate;

a local exhaust capable of locally exhausting a dust generating portion of said moving mechanism;

a flow rate regulator in one of said gas supply, said chamber exhaust and said local exhaust;

a controller; and

a pressure detector for detecting pressure in said load lock chamber, wherein

while locally exhausting said dust generating portion, the inside pressure of the load lock chamber is kept greater than a pressure of said chamber exhaust [exhaust line].

29. (Amended) A substrate processing apparatus, as recited in claim 28, wherein said inside pressure of the load lock chamber is kept greater than the atmospheric pressure while locally exhausting said dust generating portion.

Remarks

Reconsideration and allowance of the subject application are respectfully requested. Claims 1-19 and 27-29 remain pending, claims 1, 12, 15, and 28

being independent. In this amendment, applicant has amended claims 1, 5, 7, 12, 15-17, and 27-29.

Objection to the Drawings

As set forth on page 2 of the Office Action, the Examiner objects to the drawings based on an alleged inconsistency between the reference numerals used therein and the description of the figures provided in the specification. Specifically, the Examiner asserts that the use of the reference numeral 12 is incorrect because the corresponding element is described in the specification as "vacuum exhaust line 121". In response, applicant directs the Examiner's attention, for example, to page 24, lines 3, 7, and 11 of the specification which describes the element which is labeled by reference numeral 12 as a "vacuum exhaust line". Therefore, applicant submits that the use of the reference numeral 12 in the figures is proper and consistent with the disclosure, and respectfully requests reconsideration and withdrawal of the objection to the drawings.

Claim Objections

As set forth on page 2 of the Office Action, the Examiner objects to claim 15 because "it is unclear whether there [are] three or four exhaust lines." Furthermore, the Examiner asserts that the use of the term "communicated" in claims 5, 7, 15-17, and 27 is unclear and indefinite.

In response, applicant notes that claim 15 clearly recites, *inter alia*, "a gas supply line," "a first vacuum exhaust line," "a second exhaust line," and a "local

exhaust." The objection to claim15 provides no basis for the assertion that the scope of these claim elements, in light of the support provided by the specification, is unclear. Although these elements are recited broadly, such breadth does not render the scope of the claim unclear. See MPEP § 2173.04 (titled "Breadth Is Not Indefiniteness").

With regard to claims 5, 7, 15-17 and 27, applicant has amended each instance of "communicated" to read --connected--, thereby addressing the concerns raised by the Examiner on page 2 of the Office Action.

In view of the above, applicant respectfully requests reconsideration and withdrawal of the objection to the claims.

Rejection Under 35 U.S.C. § 112, Second Paragraph

Claims 27-29 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. This rejection, insofar as it pertains to the presently pending claims, is respectfully traversed.

Initially, with regard to claim 27, applicant believes that the amendment which changes "communicated" to read --connected-- addresses the Examiner's rejection of this claim. With regard to claim 28, applicant has amended the last phrase therein to read that "while locally exhausting said dust generating portion, the inside pressure of the load lock chamber is kept greater than the pressure of said chamber exhaust," thereby addressing the language cited by the Examiner as being indefinite. Finally, with regard to claim 29, applicant directs

the Examiner's attention to page 14, line 14 - page 15, line 13 of the specification which supports the language which reads "said inside pressure of the load lock chamber is kept greater than the atmospheric pressure." To clarify claim 29, however, applicant has amended claim 29 to recite that the inside pressure of the load lock chamber is kept greater than the atmospheric pressure "while locally exhausting said dust generating portion." It should be noted that applicant's comments regarding claim 29, which make specific reference to a portion of the specification, are intended solely to address the Examiner's assertion that the claim is not supported by the specification. Claim 29 should not be unduly limited to cover only the specific embodiment of the disclosure, and instead should be afforded its broadest reasonable interpretation.

In view of the above, applicant respectfully requests reconsideration and withdrawal of the outstanding rejection under 35 U.S.C. § 112, second paragraph.

Prior Art Rejections

1. *Saeki*

Claims 1-9, 12, 14, 15, 17, 19, and 28-29 stand rejected under 35 U.S.C. § 102(b) as being anticipated by *Saeki* (U.S. Patent 5,223,001).[1] This rejection, insofar as it pertains to the presently pending claims, is respectfully traversed.

[1] Although the Office Action dated October 20, 1999 did not list newly-added claims 28 and 29 under the rejection under 35 U.S.C. § 102(b), the Examiner has provided an Interview Summary based on a telephonic interview of December 14, 1999, which indicates that claims 28 and 29 should have been includ d under this grounds of rejection.

As previously discussed in the amendment dated September 13, 1999, *Saeki* discloses a vacuum processing apparatus having a load-lock chamber 1, a vacuum processing chamber 15, an exhaust pipe 2 connected at one end of the load-lock chamber 1 and connected at the other end to a vacuum pump 23, and a conveying mechanism for conveying a semiconductor wafer 4 within the load-lock chamber 1. The inner surface of the load-lock chamber ceiling includes a concave portion 7 in which the semiconductor wafer 4 is raised by the conveying mechanism so that the semiconductor wafer 4 is isolated from particles introduced into the load-lock chamber 1 during an exhaust operation.

In response to amendments and remarks presented in the Amendment dated September 13, 1999, which attempted to distinguish the claimed invention over *Saeki* by asserting, for example, that independent claim 1 which includes, *inter alia*, a controller which "during movement of [a] substrate ... and exhausting of the dust generating portion of [a] moving mechanism ... controls [a] flow rate regulator," defines over the prior art, the Examiner makes numerous assertions of inherency to maintain the outstanding rejection of claims.

Specifically, the Examiner first states that "it is inherent that a flow regulator is used on the gas supply lines and exhaust lines [of *Saeki*], so that the flow of gas into the chamber or the exhausting of the chamber can be controlled." Next, the Examiner asserts that "it is inherent that the controlling apparatus that is not shown of *Saeki* would have used detecting devices and regulators to control the different pressure settings for chamber 7 and load lock chamber 1." Addressing certain dependent claims on page 5 of the Office Action, the Examiner

further asserts that "it is inherent that the controlling apparatus that is not shown in *Saeki* would have used detecting devices, signals from the detecting devices and regulators to control the different pressure settings for chamber 7 and load lock chamber 1." Addressing claim 12, the Examiner states on page 5 of the Office Action that "it is inherent that the controller uses sensors to control the exhaust amount, so that a proper amount of the chamber is exhausted to remove any dust."

Initially, applicant finds not support for, and disagree with, the numerous assertions of inherency which are relied on to reject the claims as being allegedly anticipated by *Saeki*. If the outstanding rejection is maintained, applicant requests that the Examiner provide some factual support for such assertions. In an effort to expedite prosecution of the present application, however, and in response to the Examiner's stated position/suggestions on pages 4-5 of the Office Action, applicant has amended independent claim 1 so that it is clear that "during movement of said substrate by said moving mechanism, said gas supply supplies gas to said load lock chamber, said valve is opened, and said local exhaust exhausts the dust generating portion of said moving mechanism." Furthermore, applicant has amended independent claim 12 so that the last phrase therein reads "during movement of said substrate by said moving mechanism, said controller compares the exhaust amount of said local exhaust with a predetermined exhaust amount to monitor the status of local exhaust" to even more clearly distinguish over *Saeki*. In view of these amendments, applicant

submits that independent claims 1 and 12, as well as dependent claims 2-9, 14-15, 17 and 19 clearly define over *Saeki*.

Regarding independent claim 28, as noted above, applicant has amended claim 28 so that the last phrase now reads "while locally exhausting said dust generating portion, the inside pressure of the load lock chamber is kept greater than the pressure of said chamber exhaust." Although the Examiner has previously failed to give weight to this portion of claim 28 due to the rejection under 35 U.S.C. § 112, second paragraph, applicant submits that *Saeki* fails to teach the substrate processing apparatus as now recited in independent claim 28, or dependent claim 29.

In view of the above, applicant respectfully requests reconsideration and withdrawal of the outstanding rejection under 35 U.S.C. § 102(b).

2. *Saeki - Iwabuchi*

Claims 1-9, 12-15, 17, 19, and 27-29 stand rejected under 35 U.S.C. § 103 as being unpatentable over *Saeki* in view of *Iwabuchi et al.* (U.S. Patent 5,697,749). This rejection, insofar as it pertains to the presently pending claims, is respectfully traversed.

As set forth on pages 6-7, the Examiner relies on *Iwabuchi et al.* as allegedly teaching certain incremental features of dependent claim 27. Applicant submits, however, that *Iwabuchi* fails to make up for the deficiencies of *Saeki* discussed above with regard to the independent claims. Therefore, applicant submits that *Iwabuchi*, taken alone or in combination with *Saeki* (assuming

these references are combinable, which applicant does not admit) fails to render obvious the above-listed claims.

In view of the above, applicant respectfully requests reconsideration and withdrawal of the rejection under 35 U.S.C. § 103.

Allowable Subject Matter

Applicant appreciates the Examiner's indication on page 7 of the Office Action that claims 10, 11, 16, and 18 would be allowable if rewritten in independent form, including the limitations of their base claim and any intervening claims. For the reasons set forth above, applicant submits that all pending claims define over the prior art of record.

Conclusion

Applicant respectfully requests that the Examiner enter the amendments presented herein. As discussed above, these amendments address the outstanding rejections under 35 U.S.C. § 112, second paragraph, the outstanding objection to the claims, and even more clearly define the rejected claims over the prior art of record. Applicant submits that such amendments do not require further consideration and/or search by the Examiner.

If the Examiner has any questions or needs to discuss any matters dealing with this application, he is requested to contact D. Richard Anderson, Reg. No. 40,439 at (703) 205-8000 in the Washington, D.C. area.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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